

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of : **Confirmation No. 4361**  
Kenji SAITO et al. : Attorney Docket No. 2005\_0635A  
Serial No. 10/532,586 : Group Art Unit 3723  
Filed June 17, 2005 : Examiner Robert J. Scruggs  
  
SURFACE-TREATING PROCESS  
FOR VACUUM MEMBER : **Mail Stop: Appeal Brief-Patents**

**APPELLANTS' REPLY BRIEF**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

THE COMMISSIONER IS AUTHORIZED  
TO CHARGE ANY DEFICIENCY IN THE  
FEES FOR THIS PAPER TO DEPOSIT  
ACCOUNT NO. 23-0975

Sir:

The following is Appellants' Reply Brief, submitted under the provisions of 37 CFR § 41.41. The Reply Brief is further to the Appeal Brief filed July 10, 2009, and in response to the Examiner's Answer dated September 3, 2009.

## **STATUS OF CLAIMS**

The status of the claims is as follows:

Claims 1, 4-11, 14 and 17-19 are pending.

Claims 1, 4-11 and 17-19 are rejected.

Claims 2, 3, 12, 13, 15 and 16 are cancelled.

Claim 14 is withdrawn.

Claims 1, 4-11 and 17-19 are appealed.

A complete copy of all of the claims was provided in the Claims Appendix, attached to the Appeal Brief filed July 10, 2009.

## **GROUND OF REJECTION TO BE REVIEWED ON APPEAL**

Whether claims 1, 4-11 and 17-19 are patentable under 35 U.S.C. § 103(a) over Higuchi et al., in view of Noguchi et al., Yoneda and Miller.

Whether claim 19 is patentable under 35 U.S.C. § 103(a) over Higuchi et al. in view of Noguchi et al., Yoneda, Miller and Tsuchiya et al.

## **ARGUMENTS**

The following arguments are in addition to those set forth in the Appeal Brief filed July 10, 2009.

### **Yoneda fails to remedy the admitted deficiency of Higuchi and Noguchi**

As acknowledged by the Examiner, Higuchi and Noguchi fail to teach a liquid medium absent of any hydrogen atoms, said liquid medium being a saturated hydrocarbon in a molecule of which the hydrogen atom or hydrogen atoms are all substituted with a fluorine atom or fluorine atoms. (Please see lines 4-6 on page 4 of the Examiner's Answer.) The Examiner relies upon Yoneda and Miller in an attempt to remedy this deficiency of Higuchi and Noguchi.

However, as discussed in detail on pages 10 and 11 of the Appeal Brief, Yoneda fails to remedy the admitted deficiency of Higuchi and Noguchi, because Yoneda fails to teach a compound wherein all the hydrogen atoms have been replaced with fluorine atoms. In the sentence bridging pages 6 to 7 of the Examiner's Answer, the Examiner states, "Yoneda teaches of using fluorocarbons which by definition have had all the hydrogen atoms replaced by fluorine atoms, which is disclosed in (Column 1, Lines 34-38) of Yoneda".

However, Appellants respectfully assert that this passage of Yoneda does not teach a fluorocarbon in which all of the hydrogen atoms are replaced by fluorine atoms. Yoneda merely teaches, as a non-aqueous liquid used in a polishing process, a fluorinated inert liquid such as hydrofluoroether, hydrofluorocarbon and chlorofluorocarbon, each of which have either a hydrogen atom or chlorine atom. From this disclosure, it cannot be said that Yoneda teaches using "fluorocarbons which by definition have all of the hydrogen atoms replaced with fluorine atoms," particularly since the disclosure relied upon by the Examiner includes two compounds which contain hydrogen.

Since Yoneda is relied upon by the Examiner to remedy the admitted deficiency of Higuchi and Noguchi, and since Yoneda fails to teach that which is asserted by the Examiner, it is evident that the rejections should be withdrawn for this reason alone.

**The Dictionary.com reference teaches away from the invention**

Further, on page 7, lines 1-8 of the Examiner's Answer, the Examiner refers to Dictionary.com. The definition of fluorocarbon in the cited Dictionary.com reference describes, "An inert liquid ... halocarbon compound in which fluorine replaces some or all hydrogen molecules, used as ... lubricants ...". (Emphasis added.) Initially, Appellants note that Yoneda does not teach fluorocarbons in general, but rather, refers to specific compounds, as discussed above.

Further, as mentioned in the fourth full paragraph on page 12 of the Appeal Brief, the mechanically polishing step recited in the Appellants' claims needs or makes use of friction, whereas lubricants prevent or decrease friction. Thus, Appellants respectfully assert that the definition of Dictionary.com, as relied upon by the Examiner, actually teaches away from the claimed method.

**One skilled in the art would not have looked to the teachings of Yoneda or Miller  
from the teachings of Higuchi and Noguchi**

The Examiner states, "the examiner has clearly stated why one could look to the teachings of Yoneda and Miller, which again could provide a non-aqueous liquid that is non-flammable and explosion proof thereby more effectively and safely carrying out a polishing process...". (Please see page 7, lines 2-5 from the bottom of the Examiner's Answer.)

Appellants respectfully disagree with the Examiner's assertion. Appellants refer to the comments set forth on page 11, paragraph 1 to page 13, paragraph 1 of the Appeal Brief.

Additionally, Higuchi discloses on paragraph [0018] that "According to the physical polishing approach of this invention ... it becomes possible to be stabilized also economically and efficiently and to manufacture an acceleration cavity". (Emphasis added.)

Further, Noguchi discloses on paragraph [0029] that "The polishing process of claim 1 ... not only eliminates an adverse effect caused by gas which generates during polishing but also has an effect of preventing uneven surface caused by polishing liquid and an effect of significantly improving an appearance of surface after polishing".

Thus, the polishing processes of Higuchi and Noguchi were quite satisfactory to those of ordinary skill in the art at the time the present invention was made. Thus, one of ordinary skill in the art would not have looked to the teachings of Yoneda and/or Miller to alter the teachings of Higuchi and/or Noguchi.

Additionally, although the Examiner states that "one could look to the teachings of Yoneda and

Miller, which again could provide a non-aqueous liquid that is non-flammable and explosion proof thereby more effectively and safely carrying out a polishing process”, neither Higuchi nor Noguchi discloses or suggests problems directed to flammability, explosion protection, efficiency or safety. Thus, the Examiner’s statement is an unsupported generalization.

Further, the Examiner states, on page 9, line 3-5, that “[t]he particular problem being addressed between the references is using a fluorocarbon compound therefore the technical problem is similar.” (Emphasis added.) Appellants respectfully assert that this statement is untenable. Initially, this statement by the Examiner is made in response to Appellants’ hindsight argument. Thus, the Examiner is attempting to explain why one of ordinary skill in the art would have combined the teachings of Higuchi, Noguchi, Yoneda and Miller, without the use of impermissible hindsight. When considering the Examiner’s statement in context, it is obvious that the term “the references” includes Higuchi and Noguchi as the primary references. However, neither Higuchi nor Noguchi discloses or suggests using a fluorocarbon compound. Thus, the Examiner’s assertion that “the particular problem between the references is using a fluorocarbon compound [and] therefore the technical problem is similar” is clearly untenable. Using a fluorocarbon compound is not the particular problem being addressed between “the references.” Thus, this assertion does not demonstrate why one of ordinary skill in the art would have combined the references in the manner proposed by the Examiner.

#### **Appellants have argued against the combination of references**

The Examiner states, on page 9, lines 8-11, that “It appears that the appellant has considered each reference individually rather than taking each reference for what they teach and considering the combination as a whole”. Appellants respectfully assert that this statement is inaccurate, as Appellants have repeatedly explained that it is the combination of the cited references which fails to render Appellants’ method obvious. In particular, Appellants have argued that Yoneda fails to remedy the admitted deficiency of the primary references (Higuchi and Noguchi); that one of ordinary skill in the art would not have been motivated to look to the teachings of Yoneda and Miller, absent the use of impermissible hindsight; and that Appellants’ claimed method provides unexpected results when compared to the closest prior art. Thus, it is evident that Appellants have not argued against the references individually, contrary to the Examiner’s assertion.

**Appellants' claimed process provides unexpected results**

Appellants have provided detailed arguments regarding the unexpected results achieved by the claimed process. Please see the comments set forth on pages 13-16 of the Appeal Brief.

The Examiner states, on page 10, lines 8-11, that “the combination would also create this effect therefore it is the opinion of the examiner that the evidence does not outweigh the obviousness combination”. Appellants reiterate that this statement is unreasonable.

Specifically, Appellants have provided evidence that occlusion of hydrogen as a solid solution into the vacuum member is dramatically suppressed by mechanically polishing the niobium sample with a liquid medium including a saturated hydrocarbon in a molecule of which a hydrogen atom or hydrogen atoms are all substituted with a fluorine atom or fluorine atoms. Additionally, for the reasons discussed in detail on page 15, paragraph 1 to page 16, paragraph 1, the Examiner's position is untenable.

The Examiner also states, on page 10, lines 10-11, that “one could still combine the references above in order to provide a non-flammable and explosion proof solution”. (Emphasis added.) However, the technical problem of Appellants' invention is to prevent occlusion of hydrogen as a solid solution into an inner surface of the vacuum member during mechanical polishing, chemical polishing or electrochemical polishing. Thus, it is apparent that the technical problem of Appellants' invention is distinct from providing a non-flammable and explosion proof solution.

The Examiner also states, on page 11, lines 8-11, that “[w]ith the rejection above one would also provide a medium including a saturated hydrocarbon in a molecule of which a hydrogen atom or hydrogen atoms are all substituted with a fluorine atom or fluorine atoms when the vacuum member is formed and polished.” However, for the reasons set forth in detail above, as well as in the Appeal Brief, Appellants assert that the Examiner's rejection is untenable. The Examiner has failed to provide any evidence to support this unsubstantiated statement, and therefore the statement is unpersuasive.

The Examiner also states, on page 11, last two lines, that “The declaration submitted by Dr. Higuchi does not outweigh the obvious combination.” The Examiner further states, on page 12, lines 1-4, that “One could still look to the teachings of Miller or Yoneda for replacing hydrogen atoms with fluorine atoms to provide a medium including a saturated hydrocarbon in a molecule of which a hydrogen atom or hydrogen atoms are all substituted with a fluorine atom or fluorine atoms when the vacuum member is formed and polished.” However, for the reasons previously discussed, this

statement is untenable.

The combination of the cited references fails to render obvious Appellants' method, as well as the unexpected results achieved by the method.

### **No predictability of the results of the claimed invention**

The Examiner states, on page 6, lines 2-5, that "One of ordinary skill in the art could have applied the known technique of having an oxidizing agent formed with nitric acid, as taught by Tsuchiya et al., in the same way to the device, of Higuchi et al. or Noguchi et al., and the results would have been predictable." (Emphasis added.) However, the results of Appellants' invention would not have been predictable, since none of the cited references disclose or suggest the effect of Appellants' invention, i.e., suppressing occlusion of hydrogen as a solid solution into an inner surface of the vacuum member.

### **Errors in the Examiner's Answer**

Appellants also wish to point out the following apparent typographical errors which are present in the Examiner's Answer, in order to clarify the record.

The phrase on page 3, line 3 from the bottom of the Examiner's Answer should recite "then subjecting the vacuum member", instead of "than subjecting the vacuum member."

The statement on page 4, lines 3-2 from the bottom should recite "Miller does not teach a saturated perfluorocarbon liquid at an ordinary temperature and pressure", rather than "Miller does not teach a saturated hydrocarbon at a ordinary temperature and pressure."

The phrase "Appellant contends on Page 11, of the appeal brief that" which appears on page 8, lines 1-2, page 9, lines 12-13, page 10, lines 14-15, and page 11, lines 11-12 of the Examiner's Answer, should be deleted.

**Conclusion**

For the reasons set forth above, as well as those provided in the previously filed Appeal Brief, the invention of claims 1, 4-11, 14 and 17-19 is clearly patentable over the combination of references relied upon by the Examiner. Thus, reversal of the above-discussed rejections is respectfully requested.

Respectfully submitted,

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